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Vir colemani sp. nov., a new commensal pontoniine shrimp (Crustacea: Decapoda: Palaemonidae) from Papua New Guinea

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ABSTRACT

A new species of pontoniine shrimp, *Vir colemani* sp. nov., is described and illustrated. A single specimen of the shrimp was found in association with a coral host, *Plerogyra sinuosa*, from Loloata Island, Papua New Guinea. *Vir colemani* sp. nov. is most closely related to *V. philippinensis* Bruce and Svoboda, 1984, and is distinguishable by its reduced rostral dentition and lack of spines on its ambulatory propods.

Keywords: *Vir colemani* sp. nov., Crustacea, Decapoda, Pontoniinae, Papua New Guinea, commensal, coral host, key to species.

INTRODUCTION

The pontoniine shrimp genus *Vir* was designated by Holthuis (1952) for the accommodation of a single species *Palaemonella orientalis* Dana, 1852, as it differed from all other species of *Palaemonella* in lacking an hepatic spine. Since then only one more species has been added to the genus, *Vir philippinensis* Bruce and Svoboda, 1984, and has since been widely reported in the Indo-west Pacific region, from the Red Sea to Japan and Western Australia and the Great Barrier Reef. *Vir orientalis* has now been reported from Kenya to the Hawaiian Islands. A third species is now described and illustrated and a key provided for the identification of specimens. It may be noted that the new species may be readily distinguished from *V. philippinensis* by its distinctive colour pattern, which first attracted the photographer's attention.

Abbreviations used: CL, post-orbital carapace length; NTM, Museum and Art Gallery of the Northern Territory, Darwin; R, rostral dentition.

SYSTEMATICS

Vir Holthuis, 1952

Vir colemani sp. nov.

(Figs 1–6)

Material examined. HOLOTYPE – ovigerous female, AMPI 1349, Loloata Island, Papua New Guinea, 15 m, on coral, coll. N. Coleman, 2 December 2002, NTM Cr.13446.

Diagnosis. A species of the genus *Vir* with short rostrum, not exceeding antennal peduncle, dentition 4/1, with first tooth situated on carapace, tip minutely bifid; ambulatory propods without spines; dactyl weakly setose, about 3.0 times longer than basal width, 0.3 of propod length.

Description. Body (Fig. 1) robust, subcylindrical, smooth, glabrous.

Rostrum (Fig. 2A) straight, horizontal, reaching almost to end of distal segment of antennal peduncle, about 0.5 of CL, with four acute equally spaced subequal dorsal teeth, each with few short setae distally, first tooth situated on carapace, tip (Fig. 5A) acute, bifid, with three short setae in notch, ventral margin straight, non-setose, with single acute tooth lightly distal to anterior dorsal tooth. Carapace inflated, orbit obsolescent, inferior orbital angle produced (Fig. 2B), rounded, antennal spine well developed, acute, marginal, extending well beyond inferior orbital angle, anterolateral angle of branchiostegite broadly rounded.

Abdomen normal, third tergite not produced, sixth segment about 1.3 times length of fifth, twice as long as deep, with posterolateral and posteroventral angles bluntly produced; pleura of first three segments enlarged, broadly rounded, of fifth and sixth segments small, rounded. Telson (Fig. 2G) about 0.6 of CL, 2.5 times longer than anterior width, lateral margins convergent, sublinear, with two pairs of small subequal dorsal spines at about 0.65 and 0.78 of telson length, separated by 0.14 of the telson length, posterior margin (Fig. 2H) about 0.4 of anterior margin width, rounded, without median process, lateral spines small, similar to dorsal spines, intermediate spines robust, about 0.16 of telson length, submedian spines about 0.65 of intermediate spine length, setulose.

Antennule (Fig. 2C) normal, proximal segment of peduncle (Fig. 2D) with small acute ventromedial tooth,

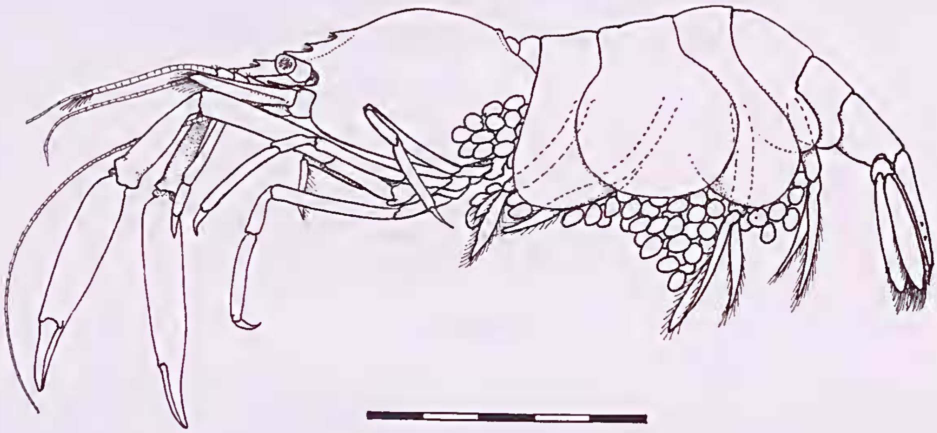

Fig. 1. *Vir colemani* sp. nov., ovigerous female holotype, Loloata Island, NTM Cr.13446. Scale bar in mm.

anterolateral margin (Fig. 5B) convex, setose, with small acute tooth laterally, lateral margin convex, statocyst normal with oval statolith, stylocerite slender, acute, reaching to half segment length; intermediate and distal segments subequal, together about 0.6 of proximal segment length; flagella long, slender, upper flagellum biramous, proximal 11 segments fused, shorter free ramus with three segments, longer with 12 segments, about 0.6 of length of fused segments, with seven groups of aesthetases.

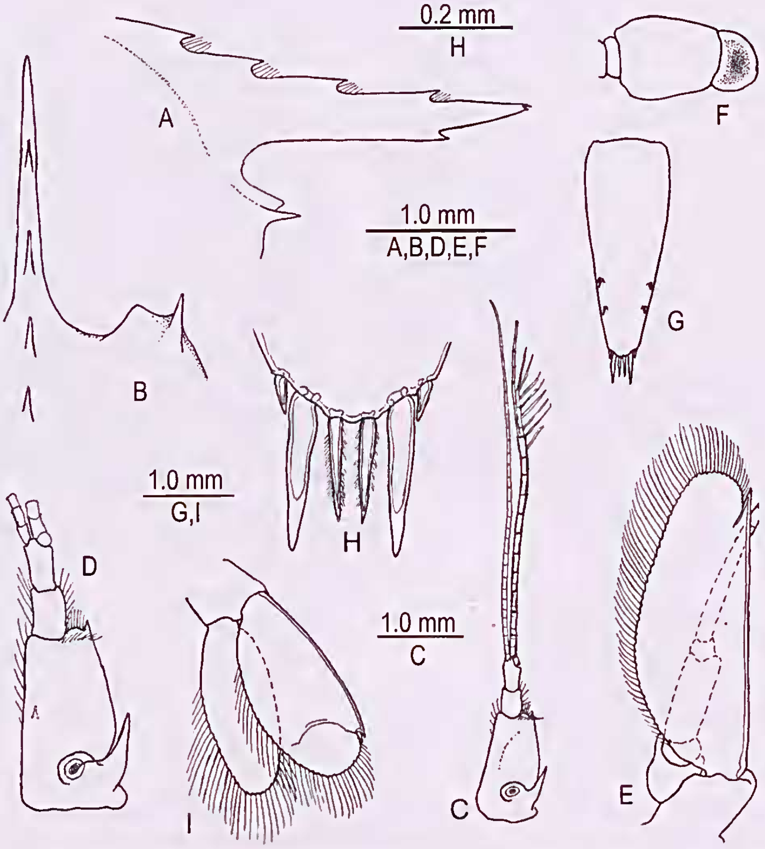

Fig. 2. *Vir colemani* sp. nov., ovigerous female holotype, Loloata Island, NTM Cr.13446. **A**, anterior carapace and rostrum, lateral; **B**, same right dorsal; **C**, antennule; **D**, same, peduncle; **E**, antenna; **F**, eye, dorsal; **G**, telson; **H**, same, posterior spines; **I**, uropod.

Antenna (Fig. 2E) normal; basicerite weakly armed with blunt distolateral lobe only; carpocerite subcylindrical, about 3.0 times longer than wide, reaching to about 0.4 of scaphocerite length, flagellum well developed; scaphocerite extending well beyond antennal peduncle, about 2.6 times longer than greatest width at 0.4 of length, distal margin broadly rounded, about 0.6 of greatest width, lateral margin straight, with strong acute distal tooth, not exceeding distal border of lamella, flagellum well developed.

Eye (Fig. 2F) with feebly pigmented globular cornea, about 0.12 of CL; stalk subcylindrical, 1.4 times longer than width, narrower distally.

Mandible (Fig. 3A) with corpus robust, with small non-setose single segmented palp (Fig. 5E), about 2.6 times longer than width, right molar process (Fig. 5C) distally oblique, with two large blunt teeth posteriorly, small tuft of short setae anteriorly; incisor process (Fig. 5D) distally truncate with three large acute teeth.

Maxillula (Fig. 3B) with distinctly bilobed palp (Fig. 5F), upper lobe non-setose, lower lobe with small uncinate seta; upper lacinia normal, with about 11 robust simple spines distally; lower lacinia lost in dissection.

Maxilla (Fig. 3C) with tapering non-setose palp, basal endite bilobed, lobes similar, slender, with seven to eight slender simple setae distally, coxal endite obsolete, medial margin straight; scaphognathite well developed about 3.5 times longer than wide, anterior lobe narrow, deeply emarginate medially, posterior lobe large, rounded.

First maxilliped (Fig. 3D) with tapering palp, with single preterminal medial seta, basal and coxal endites distinct, basal endite broad, anterolateral border sparsely setose, medial margin straight, with numerous slender simple setae, coxal endite medially biconvex, sparsely setose, exopod well developed, flagellum with numerous plumose setae distally, caridean lobe well developed, narrow, coxa with large triangular epipod, anterior lobe larger than posterior.

Second maxilliped (Fig. 3E) of normal form, exopod well developed with numerous plumose setae distally, coxa with small medial process, epipod small, simple, rounded, without podobranch.

Third maxilliped (Fig. 3F) with endopod slender, reaching to about distal end of carpocerite; ischiomerus and basis distinct, ischiomerus about 5.1 times longer than width, tapering slightly distally, sparsely setose medially, otherwise glabrous, carpal segment about 5.2 times longer than wide, 0.66 of ischiomeral length, subcylindrical, with sparse groups of long simple spiniform setae medially; terminal segment about 0.4 of ischiomeral length, tapering distally with short robust terminal spine (Fig. 5G), medial margin with about six groups of short spines, lateral margin sparsely setose;

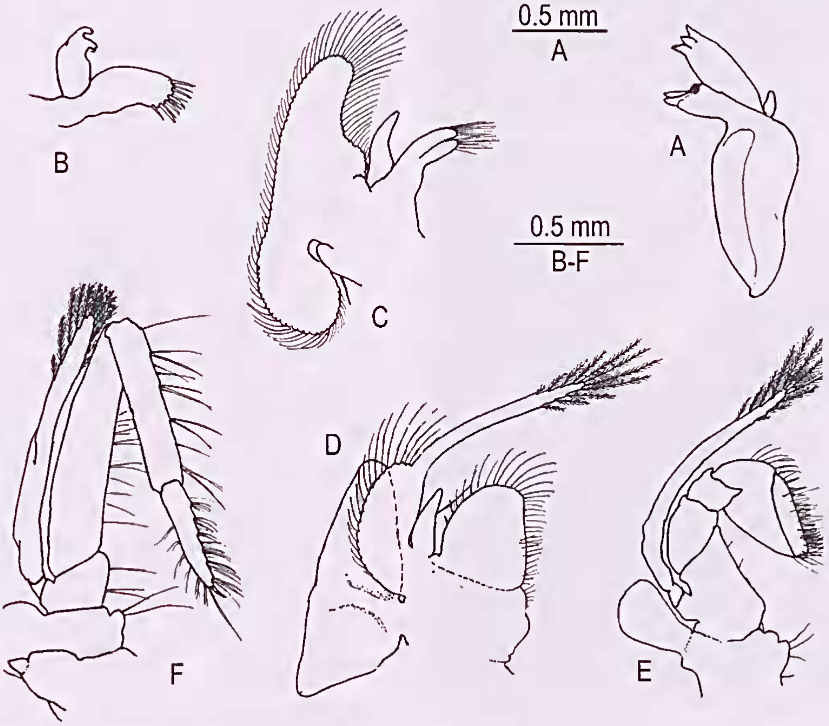

Fig. 3. *Vir colemani* sp. nov., ovigerous female holotype, Loloata Island, NTM Cr.13446. **A**, mandible; **B**, maxillula, lower lacinia lost; **C**, maxilla; **D**, first maxilliped; **E**, second maxilliped; **F**, third maxilliped.

basis normal, exopod well developed with numerous plumose setae distally; coxa with small setose medial lobe, rounded epipod laterally, with rudimentary arthrobranch. Fourth thoracic sternite with strong acute median process.

First pereiopod (Fig. 4A) slender, exceeding carpocerite by carpus and chela; chela (Fig. 4B) normal, slightly compressed, palm twice as long as depth, with three rows of cleaning setae proximoventrally, fingers about subequal to palm length, slender, 4.8 times longer than proximal width, tapering, with small simple hooked tip distally, cutting edges simple, entire; carpus about 1.65 times chela length, slender, 6.3 times longer than distal width, tapering slightly proximally, with several cleaning setae distoventrally; merus subequal to carpus length, uniform, 7.0 times longer than wide; ischium and basis normal; coxa with small setose ventromedial lobe.

Second pereiopods subequal and similar; major pereiopod (Fig. 4C) with chela (Fig. 4D) about 1.56 times CL, palm smooth, about 3.6 times longer than depth, feebly swollen, tapering slightly distally, fingers (Fig. 4E) about 0.5 of palm length, slender, dactylus about 4.2 times longer than proximal depth, dorsal margin convex, tip hooked, acute, cutting edge with two low teeth at half length, distal cutting edge laminar, entire, proximal cutting edge blunt, fixed finger similar, with single acute tooth at half length, distal cutting edge laminar, entire, proximal cutting edge with low tooth with three smaller teeth proximally; carpus (Fig. 4F) about 0.5 of chela length, 4.0 times longer than width, tapering proximally, constricted then flared distally with blunt angular dorsal lobe; merus 0.75 of palm length, 4.7 times longer than central width, subuniform, unarmed; ischium about 0.5 of palm length, 3.5 times longer than distal width, tapering proximally, unarmed. Basis and coxa without special features. Minor second pereiopod similar, chela about 0.98 of major chela length.

Third pereiopod (Fig. 4G) moderately slender, exceeding carpocerite by carpus, propod and dactyl; dactyl simple, moderately curved, about 0.3 of propod length, 3.0 times longer than basal width, corpus 2.1 times longer than basal width, distal width about 0.33 of basal width, convex, dorsal margin with single slender seta at 0.6 of length, with two short slender sensory setae distolaterally, ventral margin sublinear, unguis distinctly demarcated, about 0.5 of corpus length, simple, curved, 3.5 times longer than basal width; propod about 0.5 of CL, 7.5 times longer than

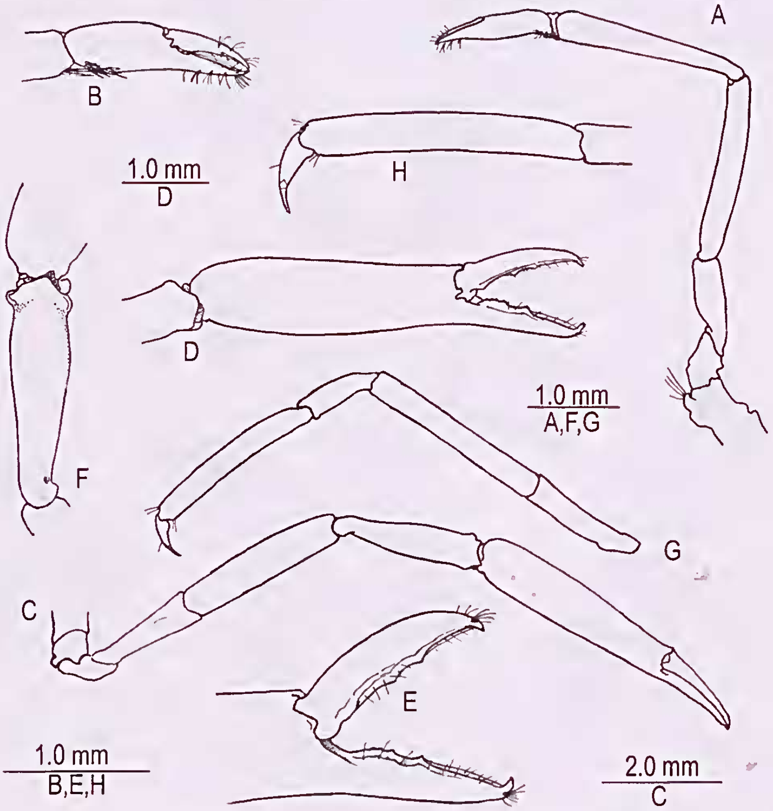

Fig. 4. *Vir colemani* sp. nov., ovigerous female holotype, Loloata Island, NTM Cr.13446. **A**, first pereiopod; **B**, same, chela; **C**, right second pereiopod; **D**, same, chela; **E**, same, fingers; **F**, same, carpus, dorsal; **G**, third pereiopod; **H**, same, propod and dactyl.

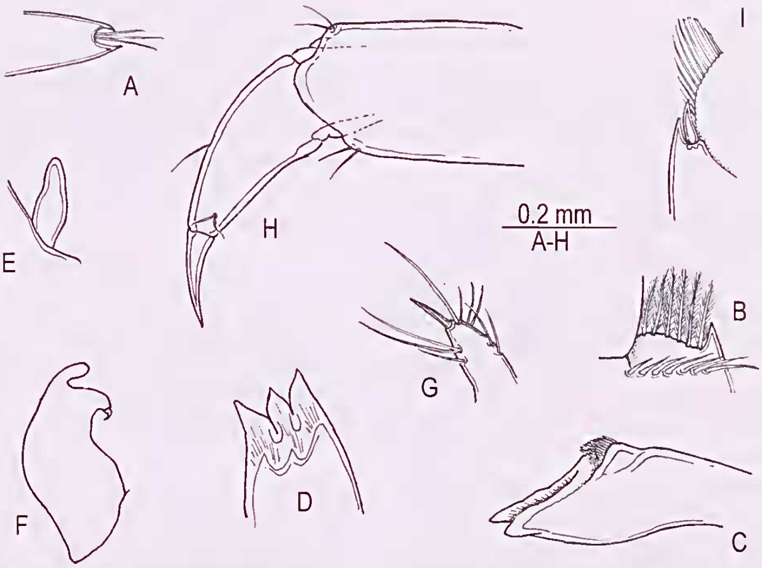

Fig. 5. *Vir colemani* sp. nov., ovigerous female holotype, Loloata Island, NTM Cr.13446. **A**, rostrum, distal end; **B**, Antennal peduncle, proximal segment, distolateral angle; **C**, mandible, molar process; **D**, same, incisor process; **E**, same, palp; **F**, maxillula, palp; **G**, third maxilliped, tip of terminal segment; **H**, third pereiopod, distal propod and dactyl; **I**, exopod of uropod, posterolateral angle.

wide, slightly compressed, uniform, with few small, slender setae distally, without distal or ventral spines; carpus normal, about 0.9 of propod length, unarmed; merus subequal to propod length, 7.0 times longer than wide, uniform, unarmed; ischium, basis and coxa without special features. Fourth pereiopod similar to third, propod about 1.1 of third propod length. Fifth pereiopod similar, propod subequal to third propod length.

Uropod (Fig. 2I) extending well beyond posterior telson spines, with protopodite robust, unarmed; endopod 2.3 times longer than wide, lateral margin feebly convex non-setose with small acute posterolateral tooth distally (Fig. 5I), with larger, curved mobile spine medially; endopod 2.4 times longer than wide, about 0.9 of exopod length.

Ova very numerous and small.

Measurements. Total body length, (approx.) 17.0 mm; carapace and rostrum, 5.7 mm; post-orbital carapace length, 3.7 mm; major second pereiopod, chela, 5.4 mm; minor second pereiopod, chela, 5.2 mm; length of ovum, 6.0 mm.

Colouration. Holotype (Fig. 6) mainly transparent, ovary and ova whitish, intestine red-brown; antennal flagella dark red-brown; eye with two thin longitudinal red brown lines; pereiopods transparent with dark violet articulations, caudal fan colourless.

Another photograph, of a different specimen (not collected) shows a few small blue dots on the dorsal carapace.

Host. *Plerogyra sinuosa* (Dana, 1846) [Scleractinia: Caryophylliidae], known from the Red Sea to the Marshall Islands (Veron and Pichon 1980).

Etymology. Named in honour of Neville Coleman, one of the few underwater photographers who has collected specimens of his subjects over many years.

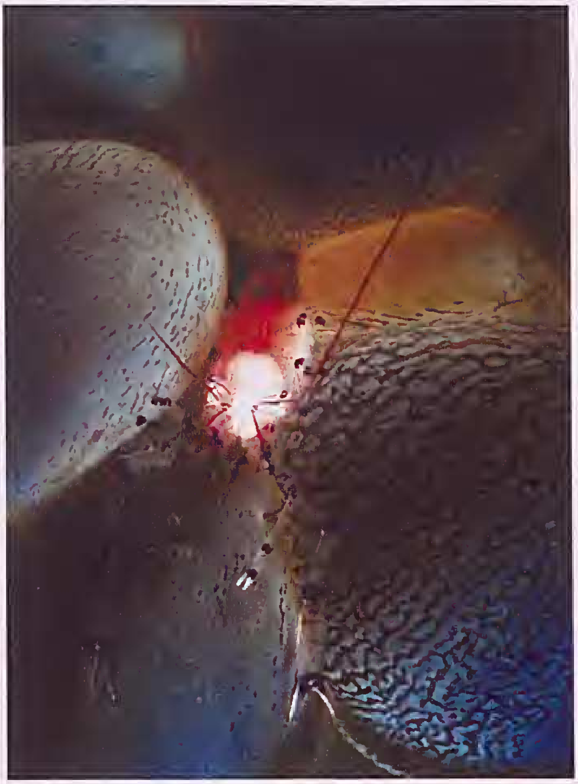

Fig. 6. *Vir colemani* sp. nov., ovigerous female holotype *in situ* on *Plerogyra sinuosa*, Loloata Island, NTM Cr.13446. Photo: N. Coleman.

Systematic position. The specimen is most closely related to *Vir philippinensis* Bruce and Svoboda, 1984. The only other species of the genus is *V. orientalis* (Dana, 1852). The three species may be separated using the following key.

Key to species of *Vir*

1a. Third pereiopod propod with numerous setae distally; third ambulatory propod about seven times longer than wide, dactylus short and curved; R.7/1 .... *V. orientalis* (Dana, 1852)
1b. Third pereiopod propod sparsely setose distally, dactylus more elongate, weakly curved 2
2a. Rostrum exceeding antennal peduncle, tip acute; distoventral ambulatory propod spinulate; third ambulatory propod about 11.5 times longer than wide; R. 4–8/0–2 .... *V. philippinensis* Bruce and Svoboda, 1984
2b. Rostrum not exceeding antennal peduncle, tip bifid; distoventral ambulatory propod without spinules; third ambulatory propod about 7.5 times longer than wide; R. 4/1 ..... *V. colemani* sp. nov.

Remarks. The shrimps belonging to the genus *Vir* are closely related to those of the genus *Philarius* Holthuis, 1952, and the three species of the *lutescens* group of *Periclimenes* – *P. lutescens* (Dana), *P. consobrinus* De Man and *P. bayeri* Holthuis. All are commensals of scleractinian corals in the Indo-west Pacific. They are characterised by robust subcylindrical bodies with well developed dentate rostra, well-developed exopods on the maxillipeds, and a robust median process on the fourth thoracic sternite, well-developed similar subequal second pereiopods, with simple dactyls on the ambulatory pereiopods. Only in *Vir* is a mandibular palp present and only in *Periclimenes* is an hepatic spine present. A further species of *Vir*, which lacks conspicuous colouration, may exist but has not yet been collected or described (Minemizu 2000).

The two species, *V. philippinensis* and *V. colemani*, may be readily separated in life by their colour patterns. *Vir philippinensis* has continuous very dark bluish lines along the whole lengths of its pereiopods as well as along its antennal flagella (colour figures, Allen and Steene 1994: 147, no locality; Debelius 1998: 204, Red Sea; 1999: 191, Mergui and Suluwesi; Minemizu 2000: 45, Japan; Coleman 1998: 34, Loloata Island, Papua New Guinea), which contrast strongly with the bright violet patches on the pereiopodal articulations in *V. colemani*.

The colour pattern of *V. orientalis* is not well known. Kemp (1922) states that his specimen from the Andaman Islands was completely transparent. He also notes that the ambulatory propod bears a small distoventral spinule and that the mandibular palp is single segmented. The specimens reported by Bruce (1972) from the Fijian Islands had the palp 2-segmented (as in the type material, now lost), and the propods devoid of spines. It associates with *Pocillopora* corals.

Both *V. orientalis and V. philippinensis* have also been recorded from Papua New Guinean waters, both from Hansa Bay by De Grave (2000), the former from *Acropora* sp. and the latter from *Euphyllia* and *Physogyra* spp.

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